WGSL Sedimentation Basin Restoration Addendum Report

Whelan, Joseph to: Arlene Kabei, Steve Armann, Rich Vaille, Stephen Tyahla, Bret Moxley, Andrew Helmlinger, Steve Wall, 'stuart.yamada@doh.hawaii.gov', 'Steven.chang@doh.hawaii.gov', 'alec.wong@doh.hawaii.gov' 08/04/2011 07:46 PM

History: This message has been replied to.

Greetings all.

The final individual project report required by the Administrative Order on Consent (AOC), which documented the restoration of the storm water sedimentation basin was submitted to you on June 15, 2011. WMH received comments from EPA on June 28, 2011. Please find attached the report documenting additional work performed to address these comments. We would appreciate your concurrence that this project is now complete. This project report will be included in the final AOC report to be submitted by August 15, 2011. Please contact me with any questions.

Best regards,

Joe

Joe Whelan

General Manager
Waste Management of Hawaii
808-668-2985, ext. 15 Office
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Sedimentation Basin Repair Addendum.pdf

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August 2, 2011

Waste Management of Hawaii
Waimanalo Gulch Sanitary Landfill
92-460 Farrington Highway
Kapolei, Hawai'i 96707

Attention: Mr. Joe Whelan

Subject: Sedimentation Basin Restoration Observation Report Addendum, Waimanalo Gulch Sanitary Landfill, Kapolei, HI

Dear Mr. Whelan:

1.0 INTRODUCTION

This letter report presents observations conducted during the restoration of the storm water sedimentation basin at the Waimanalo Gulch Sanitary Landfill (WGSL) located at 92-460 Farrington Highway in Kapolei, Hawai'i. These observations were made during the additional restoration work performed on the sedimentation basin in July 2011. Restoration of the basin was originally conducted in June 2011, as documented in the observation report submitted to Waste Management of Hawaii on June 15, 2011.

2.0 RESTORATION ACTIVITIES

The additional work to complete the restoration of the sedimentation basin was performed in accordance with the *Work Plan for Sedimentation Basin Restoration* prepared by GEI Consultants, Inc. (GEI), dated February 21, 2011 (Attachment 1). Restoration activities described in this addendum report were conducted to address comments provided by the United States Environmental Protection Agency (EPA) dated June 28, 2011 (Attachment 2). Restoration activities described in the letter report were primarily conducted by Goodfellow Bros. Inc. personnel. AECOM Technical Services, Inc. (AECOM) performed oversight for the documentation including daily reports (Attachment 3), photo documentation (Attachment 4), as-built figure preparation (Attachment 5), and report preparation. A summary of the restoration activities timeline is presented in Table 2-1.

Table 2-1: Restoration Activities Timeline

Task	Start Date	Completion Date
Subdrain Replacement	7/8/11	7/13/11
Interior Berm/Floor Restoration	7/8/11	7/18/11
Access Ramp Removal/Outfall Restoration	7/21/11	7/22/11
Re-vegetation	7/25/11	7/28/11

2.1 SUBDRAIN REPLACEMENT

The 4-inch perforated high-density polyethylene (HDPE) subdrain pipes originally installed in the southern portion of the basin area were replaced with 6-inch perforated HPDE pipes, as shown on Drawing C-11 provided in the work plan (Attachment 1). The replacement pipes were 6-inch SDR-11 HDPE pipes and were perforated with 5/16-inch holes every 6 inches, offset 90 degrees, with holes on the top, bottom, and both sides of pipe.

During replacement of the 4-inch subdrain pipes, the pipe trenches were excavated and the existing pipes and 16-ounce per square yard (oz/yd^2) filter geotextile removed and disposed of on site. The 3/4-inch drainage gravel was stockpiled for re-use. Follow excavation of the 4-inch subdrain system, the floor of the subdrain trenches were re-graded for proper drainage to the concrete riser vaults and new 16-oz/yd^2 filter geotextile installed. The drainage gravel and perforated 6-inch HDPE pipes were installed as shown on Detail 3 on Drawing C-11 provided in the work plan (Attachment 1).

The upstream (northern) ends of the 6-inch subdrain pipes were capped with a solid end cap and the downstream (southern) ends of the pipes were grouted into the concrete riser vaults using a Quickcrete mix.

The drainage gravel used during the restoration was an onsite generated material, similar to gravel used for the drainage layer material in the ongoing MSW cell construction. Additional drainage gravel was used above the subdrain trenches to establish the floor design elevation of 65.0 feet above mean sea level (msl).

2.2 INTERIOR BERM/FLOOR RESTORATION

Following replacement of the subdrain system, the interior retention berm was restored as shown on Detail 2 of Drawing C-11 provided in the work plan (Attachment 1). Restoration included installation of a 12-inch thick grouted rock rip-rap (GRP) on the exterior of the berm. Prior to installation of the GRP, a D6 dozer and an excavator to were used to grade the interior of the berm and expose the 2-foot deep keyway on the northern/southern sides of the berm for the GRP.

Onsite generated rocks (~12–24 inches in diameter) were used to layer the berm and establish design grades for the interior berm. A 2,500 pound per square inch strength fine grout material was pumped into the voids between the rocks and completed the GRP exterior on the interior berm.

Following completion of the interior berm restoration, the floor design elevation of 65.0 feet msl was established in both the northern and southern portions of the sedimentation basin. Drainage gravel material was used to establish floor elevation in the southern portion of the basin and excavated rock/soil from the interior berm was used to establish floor elevation in the northern portion of the basin.

2.3 ACCESS RAMP REMOVAL/OUTFALL RESTORATION

Following restoration of the interior berm, the access ramps into the northern and southern portions of the basin were removed. In the northern portion of the basin, this included exposing the remaining portions of the rip-rap energy dissipater at the 18-inch and 24-inch stormwater pipe outfalls. Additional rock was placed near the basin floor below the outfalls

and soil was removed from the existing rock to provide a continuous rock rip-rap from the outfalls to the floor of the basin.

2.4 RE-VEGETATION

Following removal of the access ramps, Diamond Head Sprinkler Supply installed a temporary irrigation system along interior sideslopes of the basin for re-vegetation of exposed soil. A hydro-seed mix was applied over the un-vegetated portions of the interior sideslopes and was subsequently irrigated with the temporary irrigation system to establish vegetation.

3.0 CONCLUSIONS

AECOM performed field observations and documentation of the restoration of the sedimentation basin at the WGSL. In summary, based on our observations, AECOM concludes that the work represented by the attached documentation is in conformance with the original construction documents and their design intent, the *Work Plan for Sedimentation Basin Restoration* (GEI 2011), EPA comments, and industry standard construction practices.

If you have any questions or need more information about this project please call me at (808) 356-5321.

Sincerely yours,

Ronald E. Boyle, P.E.
AECOM Technical Services, Inc.

Attachments:

1 Restoration Work Plan
2 EPA Comments
3 Daily Reports
4 Photo Log
5 As-Built Figures

cc: Jesse Frey, Waste Management of Hawaii
Justin Lottig, Waste Management of Hawaii

Attachment 1
Restoration Work Plan

GEI Consultants

180 Grand Ave, Ste 1410
Oakland, California 94612
510-350-2900
FAX 510-350-2901

February 21, 2011
Project Number 070181

Waste Management
Richard T. Von Pein, P. E.
Director of Engineering, Western Group
6640 Amber Lane
Pleasanton, CA 94566

Subject: Work Plan for Sedimentation Basin Restoration- Waimanalo Gulch Sanitary Landfill, Ewa Beach, Oahu, HI

Dear Mr. Von Pein,

As requested, GEI Consultants (GEI) has prepared a work plan to restore the sediment basin system to its intended capacity and function after the occurrence of the recent storm events in December 2010 and January 2011.

Sedimentation Basin Features

The sedimentation basin was originally designed and constructed in the late 1980's. Recently (2006-2007), there were several modifications made to the basin including the placement of an interior pond retention berm, swale energy dissipation improvements, installation of a subdrain system, and replacement of the two 42-inch corrugated metal riser pipes with concrete risers. Attachment A includes a copy of the design drawings by Shimabukuro, Endo, and Yoshizaki, Inc. showing the original basin design, and EarthTech drawings showing the recent modifications. Attachment B includes photographs of the basin in October 2007 after construction of the basin modifications.

The sedimentation basin currently receives drainage that is collected in the western concrete-lined drainage channel immediately upstream of the basin. The sedimentation basin consists of the following elements, described in an upstream to downstream direction:

- **Sedimentation Basin Inlet Apron -** The inlet located at the downstream end of the western concrete lined drainage channel consists of a 30-foot long rock riprap apron. The rock riprap sizes are approximately 18 to 24 inches in diameter.

- **Northern Basin and Interior Berm Area –** A riprapped interior berm is located in the northern (upstream) portion of the basin. The interior berm is approximately 4 feet high. The northern basin area and interior berm function as a pre-holding area to reduce the amount of coarser sediment that will continue to travel downstream in the basin, and possibly reduce the hydraulic mixing and churning of the finer sediment in the southern basin. The approximate elevation of the basin floor in this area is El. 65. The basin side slopes adjacent to the floor are inclined at 2 horizontal to 1 vertical (H: V), and the total depth of the basin in this area is approximately 18 feet. There is also a riprapped energy dissipator at the northeast corner of the basin to reduce exit velocities from 18-inch and 42-inch storm water pipes exiting into the basin at this location.

- **Southern Basin Area** - The southern portion of the basin contains a subdrain system beneath the basin floor to lower and discharge the standing water in the basin during low flow events. The subdrain system and consists of 6-inch, perforated high density polyethylene (HPDE) pipes placed in an 18-inch wide by 24-inch deep infiltration trench wrapped in a filter cloth. The trench is backfilled with ½ to ¾-inch drain rock with an overlying 6-inch sand bedding layer at the base of the sedimentation basin. The HDPE pipes are connected directly to the CMP outlet pipes (described below) to allow for conveyance of drainage from the subdrain system.

  The basin side slopes adjacent to the floor are inclined at 2 horizontal to 1 vertical, and the total depth of the basin in this area is approximately 18 feet. However, the earthen embankment at the downstream end of the pond is approximately 4.5 to 5 feet lower, to form an emergency spillway crest for the sedimentation basin (see riprapped embankment and spillway description below).

- **Outlet Riser Pipes** - There are two reinforced 48-inch diameter concrete inlet riser pipes that function as principal outlets for the sedimentation basin. The riser pipes were constructed without intermediate orifice openings, so drainage of basin inflow will be through the overflow outlet at the top of the riser or through the underlying subdrain system described previously. The vertical riser pipes outlets connect via a concrete box to 42-inch diameter horizontal corrugated metal pipes (CMP's) located at the base of the embankment at the downstream end of the sedimentation basin. The CMP's outlet on the spillway apron at the downstream toe of the embankment.

- **Riprapped Embankment and Spillway** - An earthfill embankment was constructed at the south end of the basin to provide containment on the downstream side of the pond. The embankment is armored with a 2' thick layer of grouted riprap. The crest and downstream slope of the embankment functions as an emergency spillway apron to discharge storm water downstream from the basin. The embankment was constructed with 2 H to 1 V sideslopes and a crest width of approximately 19 feet. The inboard sideslope of the embankment is

approximately 14 feet high. The outboard side of the embankment is approximately 21 feet high.

- **Vegetated Drainage Corridor** - A vegetated area is located downstream of the spillway apron and the 42-inch CMP pipe outlets. The vegetated area is approximately 200 feet long by 50 to 100 feet wide and conveys storm water flows downstream to three CMP culvert outfalls beneath Farrington Highway.

Work Plan Activities

In order to restore the basin to its intended capacity and function, specific activities will be performed for the features described previously. These activities are described in more detail and are currently being implemented or will be implemented as soon as possible after the basin is dewatered.

- **Basin Pumping** - Prior to cleaning and inspection of the sedimentation basin features, all standing water will be pumped from the basin and discharged at a POTW designated by the City and County of Honolulu.

- **Basin Inlet Apron** - All sediment and debris on top of the energy dissipator and interior berm will be removed until the underlying riprap apron and berm armoring are exposed. Any riprap missing from this area will be replaced with 18-inch to 24-inch diameter rock. The riprap will consist of basalt material with good rock quality obtained from the on-site excavation activities within the landfill.

- **Northern Basin and Interior Berm Area** - The sediment and debris from the basin will be removed to restore the basin floor to the design elevation of El.65.0. Any sediment that collected against the toe or side slopes of the basin will be removed to restore the basin slopes to their design 2 H to 1V inclination and the basin floor width to the design dimensions shown in Attachment A. The riprap armoring on the interior berm and energy dissipation swales will be fully uncovered and inspected to determine if there are areas of dislodged or missing riprap. Any areas of missing riprap will be replaced. The riprap will consist of on-site material as described previously. After drying, sediment will be used for daily cover and debris will be disposed in the landfill.

- **Southern Basin Area** - The sediment and debris from the basin will be removed to restore the basin floor to the design elevation of El.65.0. Any sediment that collected against the toe or side slopes of the basin will be removed to restore the basin slopes to their design 2 H to 1V inclination and the basin floor width to the dimensions shown in Attachment A. After removing sediment from the basin floor the subdrain trenches will be located and the 6” washed sand layer on the basin floor covering the subdrain system should be replaced. The concrete inlet riser pipes and steel trash racks will be visually inspected for debris or sediment blockage. If blockages are observed, they will be removed from the risers and

trash racks. The 42-inch CMP outfall beneath the embankment will be visually inspected for debris or sediment blockage. All sediment and debris should be removed from the CMP outfall pipes. After drying, sediment will be used for daily cover and debris will be disposed in the landfill

- **Riprapped Embankment and Spillway** - As a result of the December 2010-January 2011 storm events, sediment may have accumulated against the grouted riprap on the inboard and outboard faces of the embankment and spillway area. Any accumulated sediment in these areas will be removed and disposed properly in the landfill. Disposal may include using the material for daily cover. The overflow spillway will also be visually inspected for signs of debris that is blocking the overflow weir or that has migrated on the downstream face of the weir. All debris in the spillway will be collected and deposited in the landfill.

- **Vegetated Drainage Corridor** - The area immediately downstream of 42-inch CMP pipe outfalls and riprap apron was protected in the past with rock riprap. The riprap was placed to allow for storm water discharge to dissipate and spread throughout the vegetated area before leaving the site. These riprap areas will be inspected, and any missing or dislodged riprap will be replaced. On-site rock material will be used as described previously. All debris that migrated into the drainage corridor will be removed and disposed in the landfill.

  There may be bare soils areas within the vegetated drainage corridor that require short term erosion protection measures. These areas will be protected by seeding with erosion resistant vegetation and placement of temporary erosion control matting where necessary. We note that surface soils in the vegetated drainage corridor will be disturbed in order to construct the stilling basin outlet for the Western Surface Water Drainage System. Longer term erosion control measures for the vegetated drainage corridor will be considered during construction of the stilling basin structure.

- **Sediment and Debris Disposal** - All sediment and debris removed from the areas described previously should be disposed in the landfill. Sediment will be stockpiled and allowed to dry. The dried sediment material can then be utilized as daily and intermediate cover during landfilling operations.

- **Implementation of Work Plan** - Waste Management will implement the work plan described using available site personnel and contractors. Inspection will be performed by AECOM engineers as required.

- **Documentation of Work Plan Activities** - Photo-documentation and field reports will be prepared by landfill personnel during and after restoration activities to support final reporting efforts of work plan implementation to the USEPA.

Schedule – Liquids are scheduled to be removed from the pond by February 14th provided there is no additional rainfall. After liquids are removed removing sediment, debris and silted-in underdrain material will occur. As soon as all material is removed from the pond, the underdrain will be reconstructed, other necessary repairs made and the pond put back into service. We anticipate removing the sediment and debris, and reconstructing the pond will take approximately 4 weeks and should be completed by March 14, provided we do not receive significant additional rainfall. If storm water enters the basin prior to the removal of the sediments, we would not discharge it as storm water, except in an emergency and only after consultation with the Hawaii Department of Health and the USEPA. The water will be removed and transported to a POTW designated by the City and County of Honolulu.

Very truly yours,
GEI Consultants, Inc.

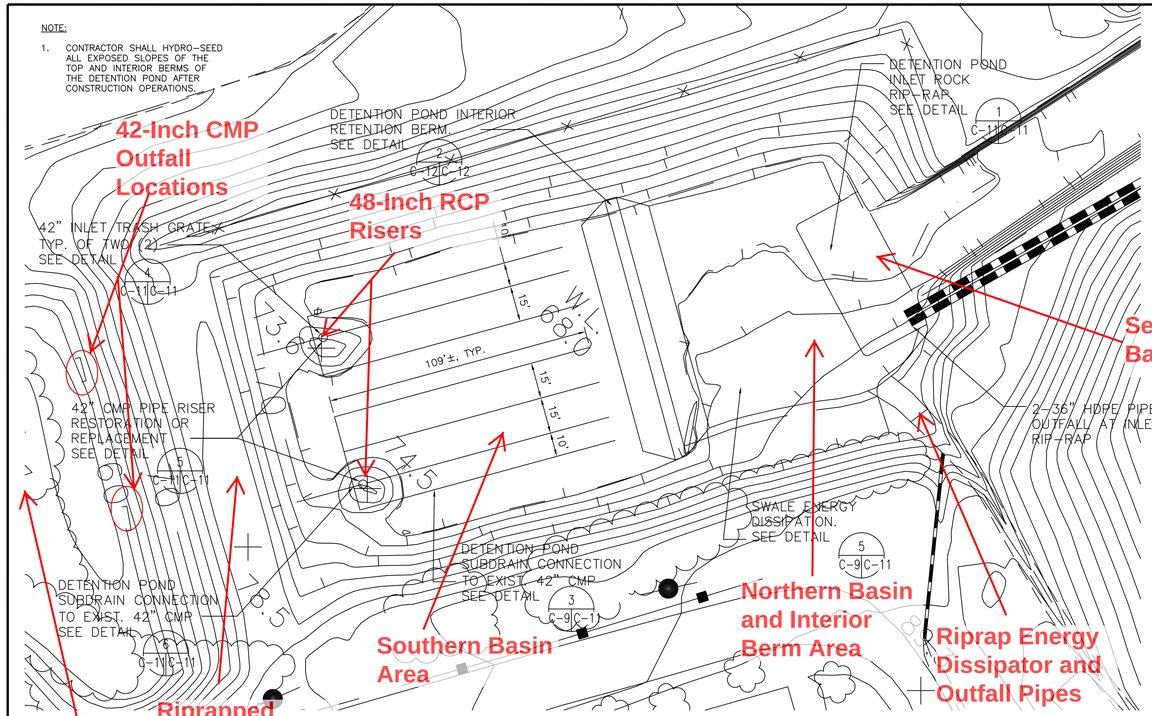
William A. Rettberg, P.E.
Vice President

Attachment A: Drawings by Shimabukuro, Endo, &Yoshizaki, Inc. and Earth Tech Depicting Basin Configuration and Features

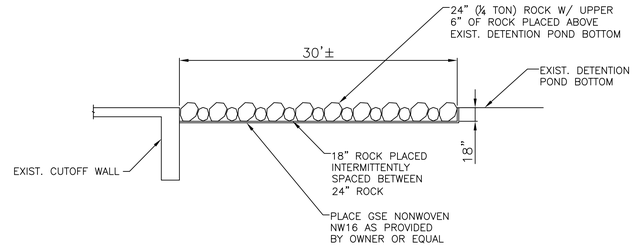
Attachment B: Photographs of the Sedimentation Basin Area in October 2007 After Construction of Modifications

ATTACHMENT A

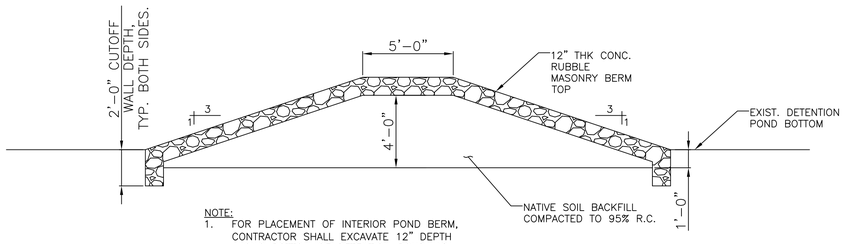
Drawings by Shimabukuro, Endo & Yoshizaki, Inc. and EarthTech Depicting Basin Configuration and Features



A C-12 DETENTION POND LAYOUT
SCALE: 1" – 30'

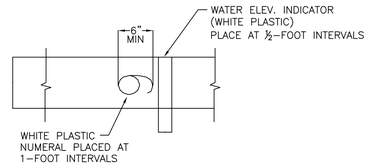


1 C-11 DETENTION POND INLET RIP-RAP
NO SCALE



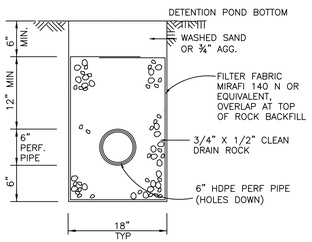
NOTE:
1. FOR PLACEMENT OF INTERIOR POND BERM, CONTRACTOR SHALL EXCAVATE 12" DEPTH ALONG BOTTOM OF DETENTION POND, AS SHOWN ABOVE, AND TO LIMITS OF THE INTERIOR POND BERM ACCORDINGLY.

2 C-11 DETENTION POND BERM
NO SCALE



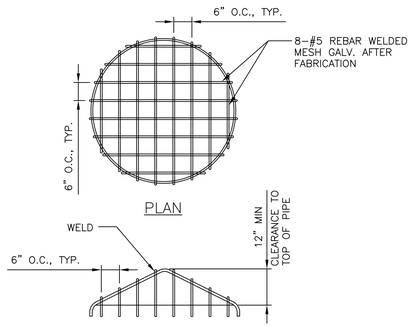
NOTE: ATTACH NUMERAL AND INDICATOR TO CONCRETE WITH ADHESIVE OR SS STRAPS.

7 C-11 NUMBER DETAIL
NO SCALE

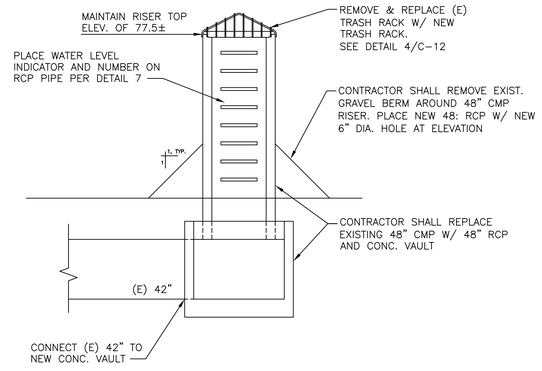


NOTE:
1. SUBDRAIN PIPES SHALL MAINTAIN A 0.5% SLOPE (MIN.) TOWARDS 42" CMP CONNECTION.

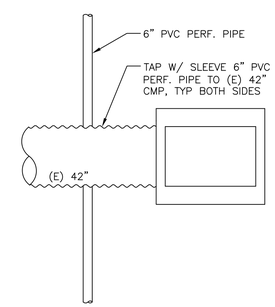
3 C-11 DETENTION POND SUBDRAIN DETAIL
NO SCALE



4 C-11 RISER GRATE
NO SCALE



5 C-11 REPLACEMENT OF (E) 42" RISER DETAIL
NO SCALE



6 C-11 6" SUBDRAIN TO 42" CMP CONNECTION DETAIL
NO SCALE

FINAL CONSTRUCTION PLANS

REV	DATE	BRIEF	BY	APPROVED

JOB NUMBER 92382
FILE NO. 92382-C-11
DESIGNED: BWR DRAWN: RKH
CHECKED: REB APPROVED: – –
SCALE: NO SCALE

BENJAMIN W. REALICA LICENSED PROFESSIONAL ENGINEER No. 11337-C HAWAII, U.S.A.

This work was prepared by me or under my supervision. ("Supervision of design" shall be as defined in Chapter 115, Hawaii Administrative Rules, Professional Engineers, Architects, Surveyors, and Landscape Architects, State of Hawaii, Subchapter 1 Section 16-115-2. Definitions effective June 30, 1994)

WASTE MANAGEMENT

PHASE 1 INTERIM ON-SITE DRAINAGE MEASURES PLANS

DETENTION POND DETAILS

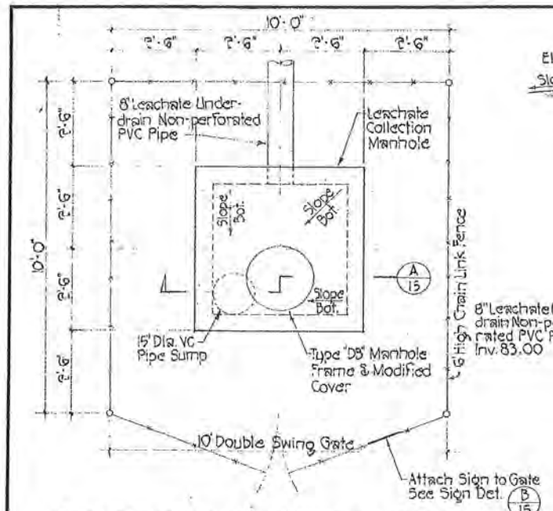
DATE: 08/01/06
DRAWING NO. C-11
SHEET 14 OF 14

Riprapped Embankment and Spillway

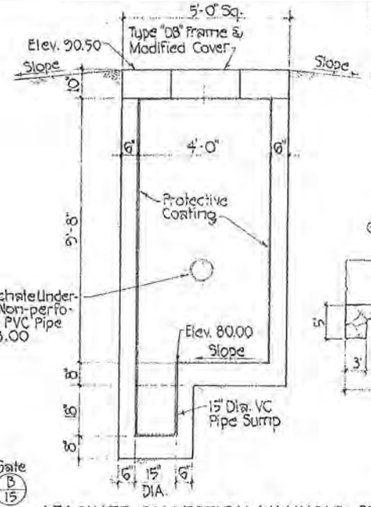
Original CMP Riser Pipe Replaced with Concrete Riser (See EarthTech Drawing C-11)

42-inch CMP Outlet

Typical Section Across Sedimentation Basin

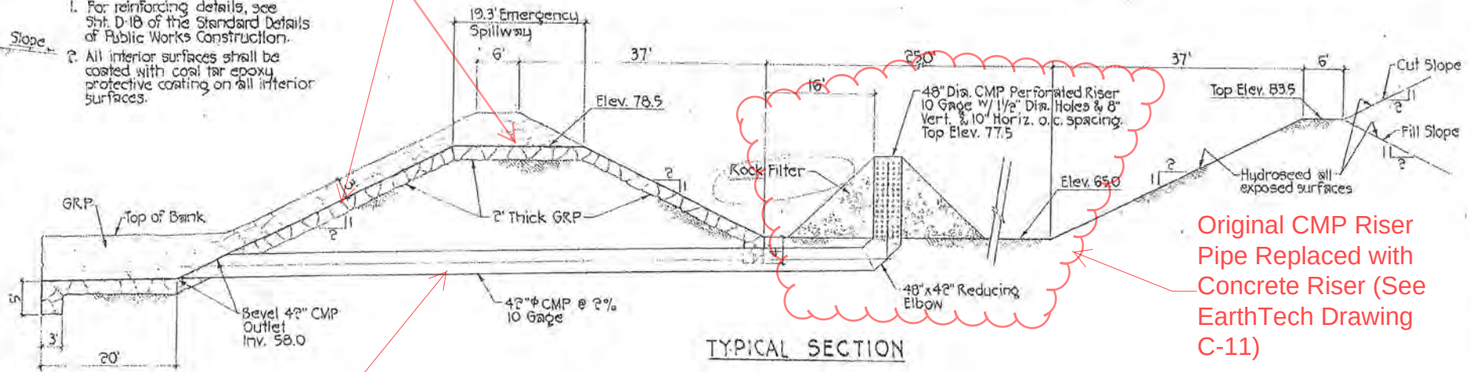


LEACHATE COLLECTION MANHOLE SITE PLAN
Scale: 1/8" = 1'-0"

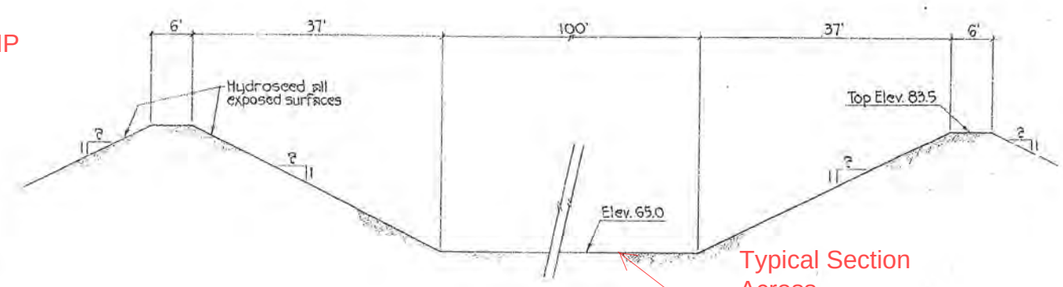


LEACHATE COLLECTION MANHOLE - SECTION A 15
(STANDARD C&C SHALLOW DRAIN MANHOLE FOR PAVEMENT AREA W/ MODIFIED BOTTOM SLAB) Scale: 1/2" = 1'-0"

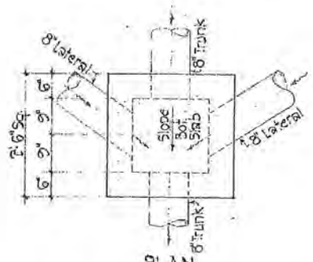
NOTES FOR LEACHATE MH & JB:
1. For reinforcing details, see Sht. D-18 of the Standard Details of Public Works Construction.
2. All interior surfaces shall be coated with coal tar epoxy protective coating on all interior surfaces.

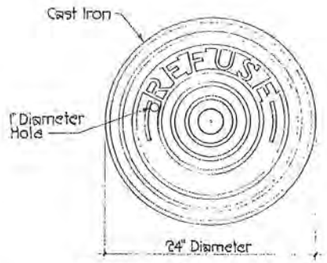


TYPICAL SECTION



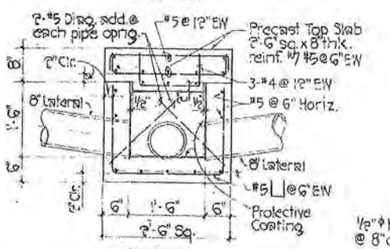
TYPICAL SECTION



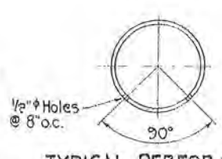


PLAN - DETAIL MODIFIED COVER
Scale: 1½" = 1'-0"

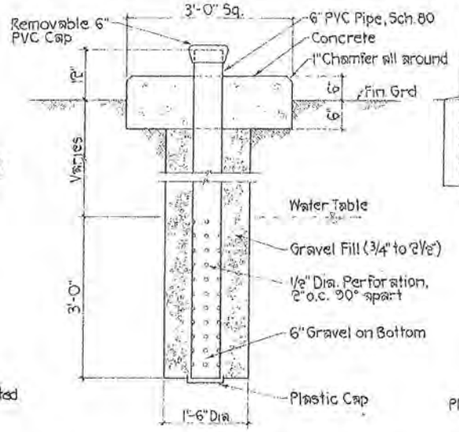
NOTES:
1. All castings shall be made accurately to the dimensions shown. Seat and cover shall be machined, not ground to secure flat and true surfaces. The cover shall not rattle in any position.
2. For details of the manhole cover, see Sht. D-30 of the Standard Details for Public Works Construction.



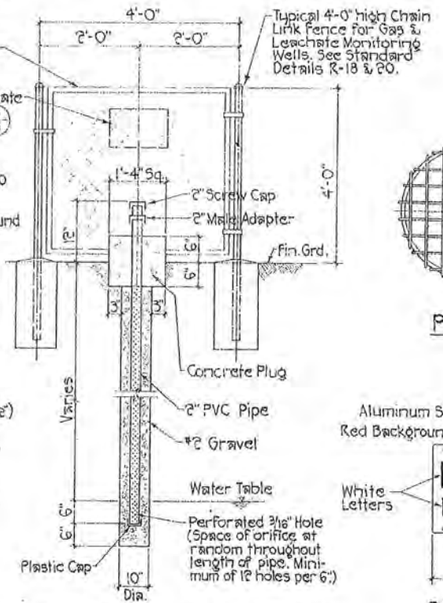
LEACHATE JUNCTION BOX DETAIL
Scale: 3/4" = 1'-0"



TYPICAL PERFORATED PVC PIPE Not to Scale

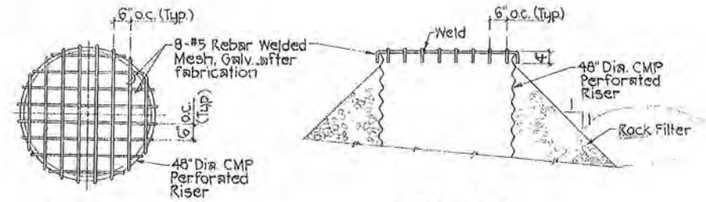


LEACHATE MONITORING WELL DETAIL
Not to Scale



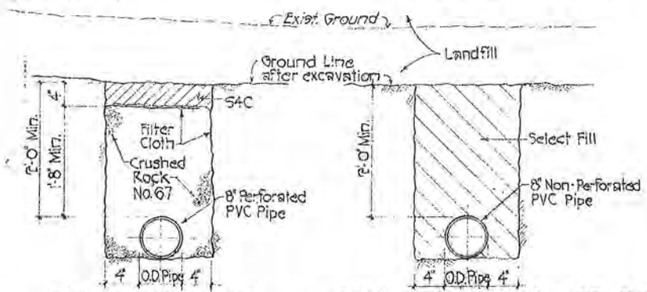
GAS MONITORING WELL DETAIL
Not to Scale

SILTING BASIN
Scale: 1" = 10'



RISER GRATE
Scale: 1½" = 1'-0"

SIGN DETAIL B 15
Not to Scale



TRUNK & LATERAL LINE
TRUNK LINE (@ STA. 1+00 TO STA. 2+00)
LEACHATE UNDERDRAIN - TYPICAL TRENCH DETAILS Not to Scale

APPROVED:

CHIEF, DIVISION OF ENGINEERING (FOR GRADING ONLY) — DATE 11/20/87

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STANLEY S. SHIMABUKURO, REGISTERED PROFESSIONAL ENGINEER, No. 1322-C, HAWAII, U.S.A.

NO.	DATE	DESCRIPTION	ENGR.	DEPT. ORD'R
		REVISIONS		APPR'D

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
DIVISION OF REFUSE COLLECTION AND DISPOSAL
WAIMANALO GULCH SANITARY LANDFILL

MISCELLANEOUS DETAILS

ENGINEER HIY — DATE OCTOBER 2, 1986
DRAFTSMAN WMI, RYY — CHECKED BY SSS
APPROVED
CHIEF, DIVISION OF REFUSE COLLECTION AND DISPOSAL

SHIMABUKURO, ENDO & YOSHIZAKI, INC.
CIVIL & STRUCTURAL ENGINEERS

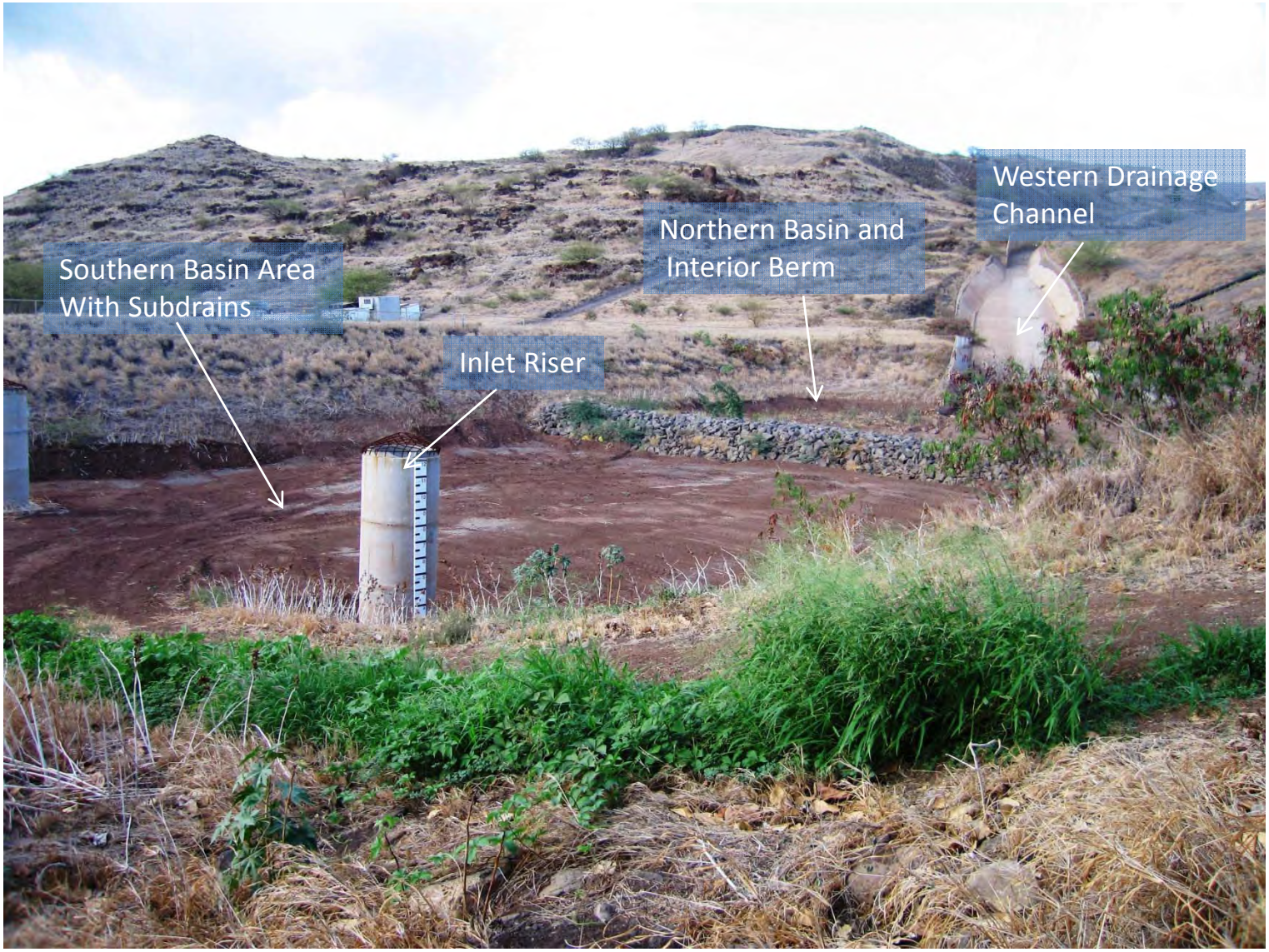
F.B.
JOB NO.

FILE | POCKET | FOLDER | AD

ATTACHMENT B

Photographs of Sedimentation Basin Area in October 2007 After Construction of Modifications

View of Basin Looking South Along the Western Concrete-Lined Drainage Channel



View of Sedimentation Basin Looking North

View along Riprapped Embankment Crest Looking West

View of Basin Looking Northeast from Riprapped Embankment Crest

Attachment 2
EPA Comments

"Punch List" for Restoration of Sedimentation Basin at Waimanalo Gulch Sanitary Landfill
(paragraph 19.h. of the January 2011 AOC between WMH and EPA)

Prepared by EPA Region 9, 28 June 2011

This punch list was prepared based EPA's site inspection of 9 June 2011 and AECOM's 15 June 2011 letter report Subject: "Sedimentation Basin Restoration Observation Report, Waimanalo Gulch Sanitary Landfill, Kapolei, HI" ("AECOM's report")

1) In the northern basin, the riprap energy dissipater at the 18- and 24-inch diameter storm water outfall pipes appears to still be in poor condition, not very expansive (particularly by the 18-inch pipe), with many soil fines still downstream of the outfalls (Photo 28 of AECOM's report).
2) The access ramps/roads built to perform the restoration need to be stabilized by either vegetation or gravel and compaction (Photo 11 of AECOM's report).
3) The interior side slopes of both the northern and southern basins need to be re-vegetated for erosion control consistent with Note 1 on Drawing C-11 of the GEI 21 February 2011 Work Plan which states "Contractor shall hydro-seed all exposed slopes of the top and interior berms of the detention pond after construction operations."
4) The Work Plan specified the removal of sediment and debris from the northern basin to restore the basin floor to its design elevation of 65.0 feet MSL and in Section 2.2 of AECOM's report it is reported that this was achieved. However, visual observation by EPA staff raised the concern that the floor of the northern basin near the upstream (northern) side of the 4-feet high interior berm might have been excavated to a greater depth thus increasing the risk of undermining the interior berm. Please revisit this part of the floor excavation and backfill and compact as necessary to prevent undermining of the interior berm. Address this item in coordination with Item 5.
5) Based on EPA staff's observations and Photos 31 and 32 of AECOM's report, it appears the removal of sediment and inspection/repair of riprap armoring the interior berm might not have been thoroughly completed. Please fully uncover, inspect and repair any damaged or missing riprap on the interior berm per the GEI Work Plan. Additionally, from what was observable, the detention pond's interior berm dimensions do not appear to coincide with those shown in Detail 2 on Drawing C-11; please restore accordingly.
6) In performing the restoration 4-inch diameter perforated HDPE pipe was used in the subdrain rather than the 6-inch noted in the design drawings because the existing ("as-built condition") was found to be 4-inch pipe. Please provide either an engineering analysis that confirms this change in pipe size is adequate to conform to the original design basis, or replace the 4-inch diameter pipe with the 6-inch size included in the approved Work Plan.

Attachment 3
Daily Reports

Daily Field Report Summary

Waimanalo Gulch Sanitary Landfill
Waste Management of Hawaii
Project No. 60191059.02.07

Date	Daily Report Notation
7/8/11	GBI begins removing 4-inch perforated HPDE subdrain pipes, to be replaced with 6-inch pipe as shown in the design drawings. Pipe delivered is a solid 6-inch SDR-11 HDPE, GBI to perforate pipe by drilling 5/16-inch holes every 6-inchs, offset 90 degrees, with holes on the top, bottom and both sides of pipe. GBI begin grading the top of the interior to prepare for grouted rock rip-rap (GRP) installation.
7/11/11	GBI continue replacing 4-inch subdrain pipes with 6-inch pipe. Existing 16-oz geotextile is removed along with the 4-inch pipes and new 16-oz geotextile installed as shown in the design drawings. Drainage gravel is re-used from previous installation completed in June 2011. GBI perforate pipe by drilling 5/16-inch holes in the 6-inch pipes, at 90 degrees offsets, with holes on the top, bottom and both sides of pipe. Upstream ends of new pipes are capped with a solid end cap, the downstream end of the pipe are grouted into the concrete vaults using Quickcrete. The 3 western subdrain pipes and geotextile/gravel encapsulation have been replaced, working on the eastern set of four pipes.
7/12/11	GBI continue replacing 4-inch subdrain pipes with 6-inch pipes and 16-oz geotextile and drainage gravel encapsulation. 6 of the 7 subdrain pipes have been replaced.
7/13/11	GBI has completed replacement of the 4-inch subdrain pipes with 6-inch pipes. Excavator and D6 dozer prepare interior berm for GRP, including exposing the 2-foot deep keyway on each side of the berm for the GRP.
7/14/11	GBI continue grading interior berm and then begin installing on-site generated rocks (~12 – 24” in diameter) to layer the berm and establish design grades for the interior berm, which includes the 12-inch GRP exterior.
7/15/11	GBI continue placing rock for the interior berm GRP exterior. Conducting grading of the southern portion of the basin using drainage gravel material to establish floor elevation of 65.0 ft MSL.
7/18/11	Island Ready Mix and GBI place 2,500 psi fine grout with a pump truck in between the rocks on the interior berm to complete the GRP exterior.
7/21/11	GBI completes grading of basin floor to the floor elevation of 65.0 ft MSL in both the northern and southern portions, grade checker place marker stakes to ensure elevation is achieved. An excavator removes access ramps into the northern and southern portions of the basin. While removing access ramp in the northern portion, soil and loose rock near the outfall of the 18- and 24-inch stormwater pipes. Additional rock placed to provide a continuous rock rip-rap from the outfalls to the floor of the basin.
7/22/11	GBI completes removal of accumulated soil at the outfall of the 18- and 24-inch stormwater pipes. Rock rip-rap is exposed along the entire length of the energy dissipater from the end of the pipe to the floor of the basin.
7/25/11	Diamond Head Sprinkler installs the irrigation system along the interior sideslopes of the basin for re-vegetation (hydro-seed to be applied).
7/26/11	Diamond Head Sprinkler applies grass hydro-seed over the interior sideslopes of the basin for re-vegetation.

Prepared By:

Dan Frerich AECOM	
Name	Signature

Attachment 4
Photo Log

Photo 1: Excavating 4-inch subdrain system for replacement with 6-inch pipe.

Photo 2: Installing new 16-oz/yd^2 geotextile filter fabric in the subdrain trench.

Photo 3: New 6-inch perforated HDPE subdrain pipe encapsulated in drainage gravel and filter fabric.

Photo 4: Connection of 6-inch subdrain pipe to the concrete vault.

Photo 5: Grading the interior berm prior to placement of grouted rock rip-rip (GRP) exterior, looking west.

Photo 6: Placing rock along the interior berm to form the GRP exterior, looking west.

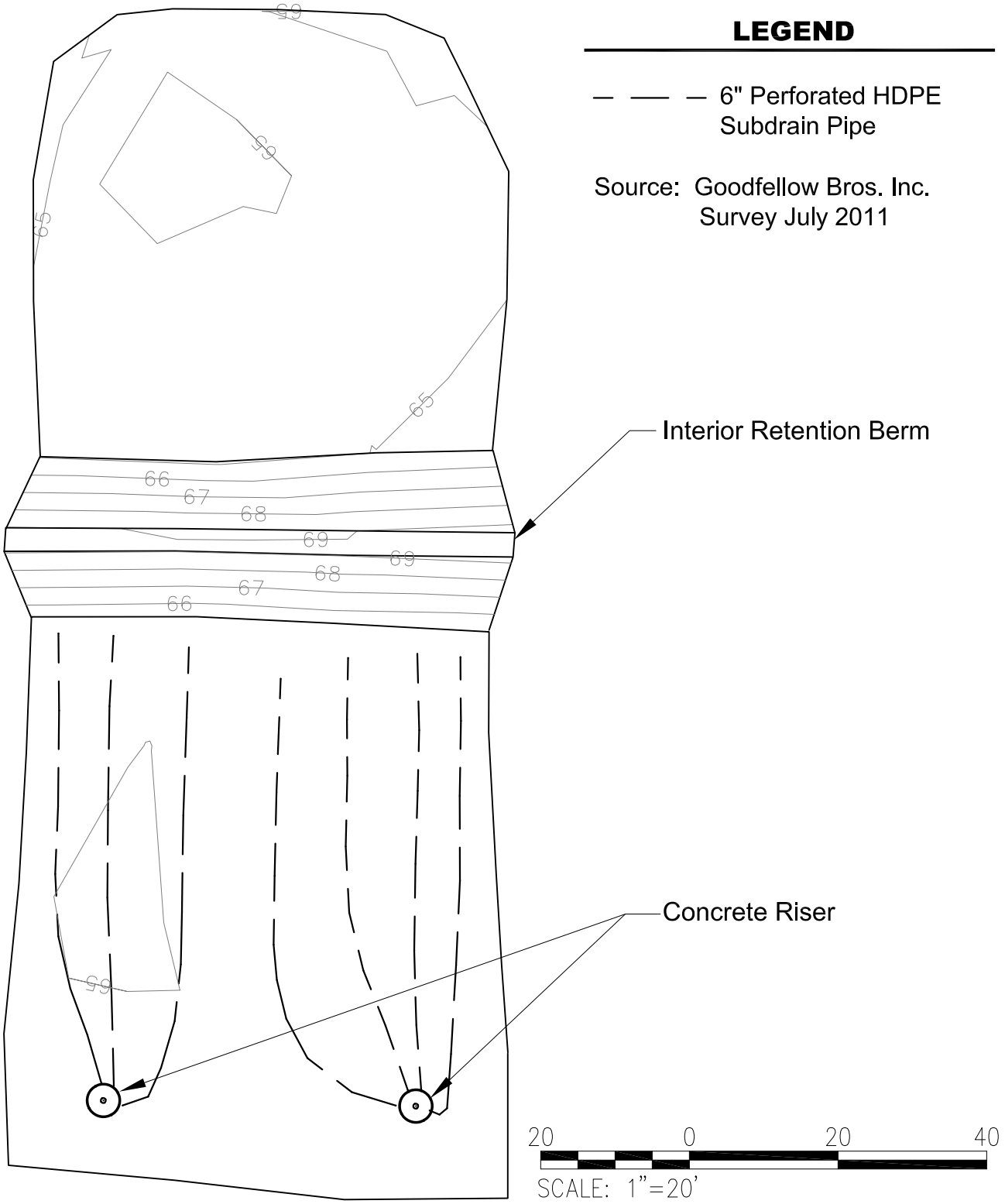
Photo 7: Completing placement of the rock along the interior berm, looking north.

Photo 8: Pumping grout between rocks along the interior berm to complete the GRP exterior.

Photo 9: 18- and 24-inch outfalls in the north eastern corner of the sedimentation basin following removal of access ramp and exposure of rock rip-rap.

Photo 10: Sedimentation basin looking northeast following completion of restoration activities.

Attachment 5
As-Built Figures



TRUE NORTH

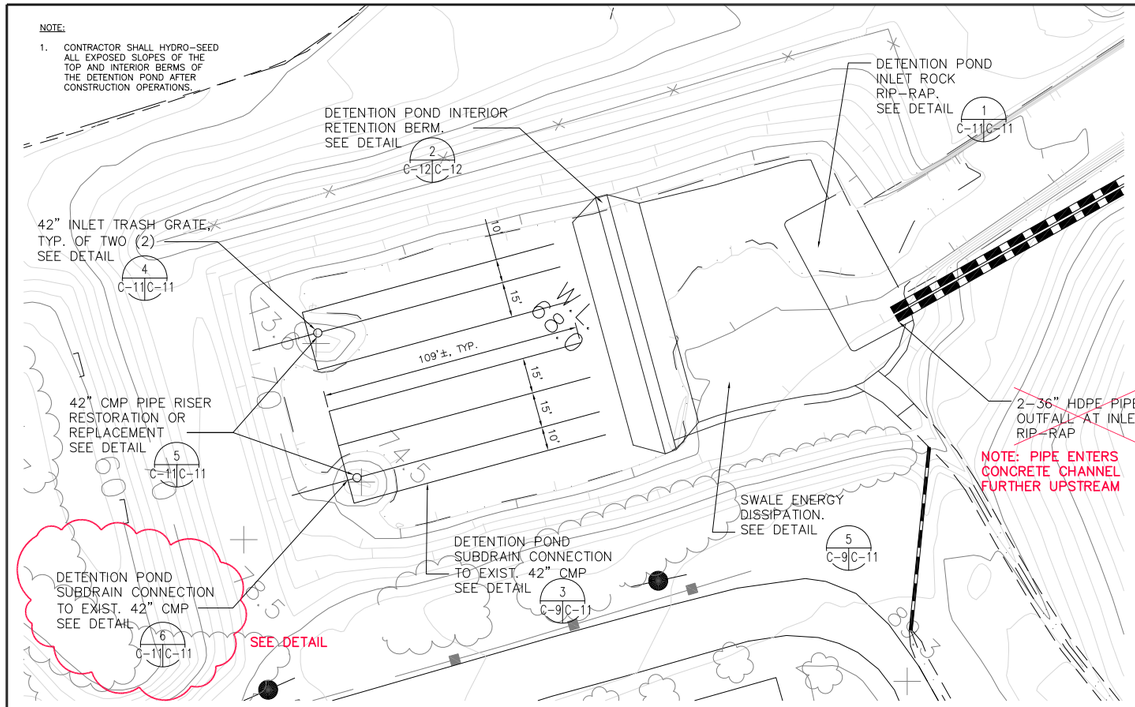
Figure 1
As-Built Survey of
Sedimentation Basin Floor

AECOM

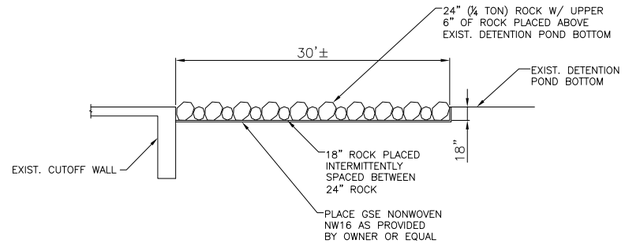
Waste Management of Hawaii
Waimanalo Gulch Sanitary Landfill
Kapolei, Oahu, Hawaii

NOTE:

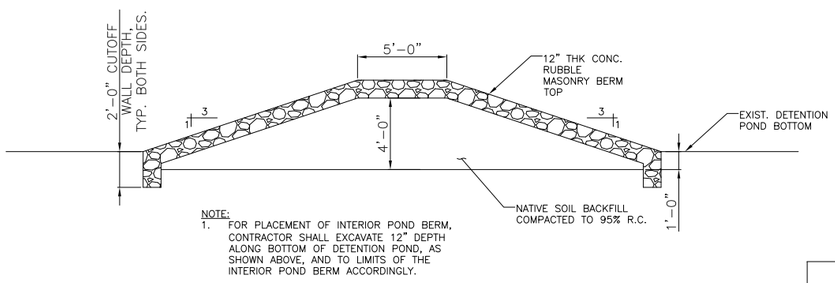
1. CONTRACTOR SHALL HYDRO-SEED ALL EXPOSED SLOPES OF THE TOP AND INTERIOR BERMS OF THE DETENTION POND AFTER CONSTRUCTION OPERATIONS.



A C-12 DETENTION POND LAYOUT
SCALE: 1" = 30'

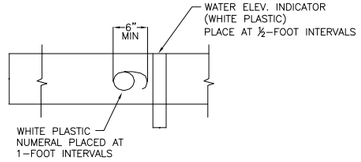


1 C-11 DETENTION POND INLET RIP-RAP
NO SCALE



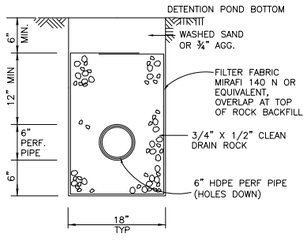
NOTE:
1. FOR PLACEMENT OF INTERIOR POND BERM, CONTRACTOR SHALL EXCAVATE 12" DEPTH ALONG BOTTOM OF DETENTION POND, AS SHOWN ABOVE, AND TO LIMITS OF THE INTERIOR POND BERM ACCORDINGLY.

2 C-11 DETENTION POND BERM
NO SCALE



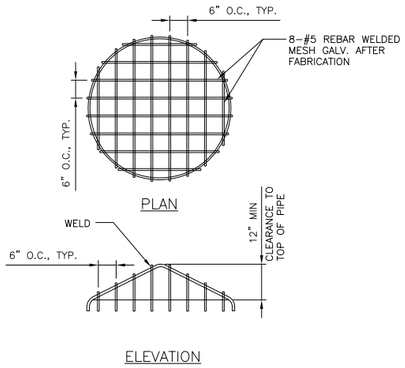
NOTE: ATTACH NUMERAL AND INDICATOR TO CONCRETE WITH ADHESIVE OR SS STRAPS.

7 C-11 NUMBER DETAIL
NO SCALE

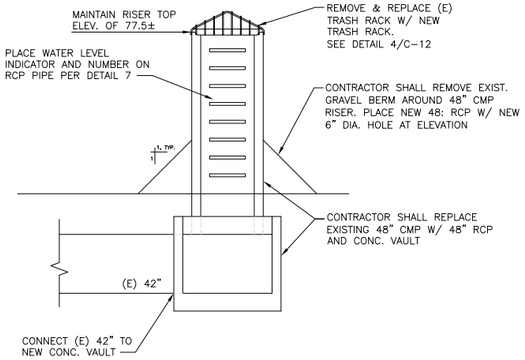


NOTE:
1. SUBDRAIN PIPES SHALL MAINTAIN A 0.5% SLOPE (MIN.) TOWARDS 42" CMP CONNECTION.

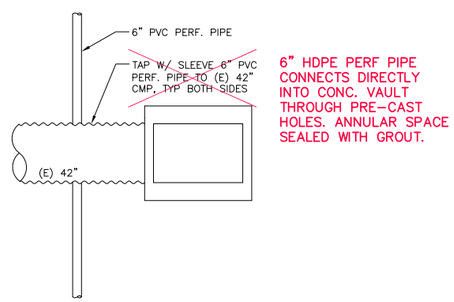
3 C-11 DETENTION POND SUBDRAIN DETAIL
NO SCALE



4 C-11 RISER GRATE
NO SCALE



5 C-11 REPLACEMENT OF (E) 42" RISER DETAIL
NO SCALE



6 C-11 6" SUBDRAIN TO 42" CMP CONNECTION DETAIL
NO SCALE

FINAL CONSTRUCTION PLANS

REV	DATE	BRIEF	BY	APPROVED
	8/1/11	AS-BUILT DRAWINGS		

JOB NUMBER 92382
FILE NO. 92382-C-11
DESIGNED: BWR DRAWN: RKH
CHECKED: REB APPROVED: - -
SCALE: NO SCALE

This work was prepared by me or under my supervision. ("Supervision of design" shall be as defined in Chapter 115, Hawaii Administrative Rules, Professional Engineers, Architects, Surveyors, and Landscape Architects, State of Hawaii, Subchapter 1 Section 16-115-2. Definitions effective June 30, 1994)

EarthTech
A tyco International Ltd. Company

WASTE MANAGEMENT

PHASE 1 INTERIM ON-SITE DRAINAGE MEASURES PLANS

DETENTION POND DETAILS

DATE: 08/01/06
DRAWING NO. C-11
SHEET 14 OF 14